

REMARKS

Claims 1-33 are pending in the application. Claims 1, 15, 16 and 22 have been amended.

In the Office Action, claims 1-3, 6, 7, 10-17, 19-25, 27-29 and 31-33 were rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent 6,351,324 (Flint). Claims 8 and 9 were rejected under 35 U.S.C. §103(a) as being unpatentable over Flint in view of U.S. Patent 5,043,744 (Fantuzzo). Claims 4, 5, 18, 26 and 30 were rejected under 35 U.S.C. §103(a) as being unpatentable over Flint. These rejections are respectfully traversed. Applicants respectfully request reconsideration and allowance of the claims in view of the following arguments.

The present invention relates to a polygon scanning system and method wherein two or more light beams impinge at different incident angles at substantially the same incident location on a polygon facet, and are sequentially used for scanning the surface of a substrate as the polygon is rotated. Embodiments include a system comprising a polygon having a reflective facet, a rotation mechanism for rotating the polygon, and a light source for directing a plurality of light beams to impinge on the facet such that each light beam impinges on the facet at a different incident angle. Each light beam is reflected by the facet to scan a particular portion of a surface of a substrate during a respective time interval when the rotation mechanism is rotating the polygon. Each of the plurality of light beams is reflected onto the substrate surface using a respective portion of the facet surface, such that the sum of the respective portions of the facet surface used to reflect the light beams is a very large percentage of the total surface area. Thus, the system has a duty cycle of close to 100 percent as well as a high data rate.

Regarding the anticipation rejection of independent claims 1, 15, 16 and 22 based on Flint, these claims have been amended for clarity to recite that all the light beams impinge on the

reflective facet of the polygon *at substantially the same incident location*. The claim amendments are supported, for example, at Figs. 1a, 2, 3 and 4, and at page 6, lines 1-18 of the present application. This is an important feature of the present invention, because it enables a greater percentage of each polygon facet to be used for scanning, thereby increasing the duty cycle for each facet. The overall data rate of the system can thus be increased by increasing the number of facets while compensating for the resultant reduced duty cycle by using the claimed invention.

The Flint reference does not disclose or suggest that all its light beams impinge on the reflective facet of the polygon at substantially the same incident location, as recited in amended claims 1, 15, 16 and 22. On the contrary, Flint explicitly shows at Fig. 2 that the two light beams impinge on polygon facet 234 at two separate incident locations 231, 232. Flint explains, at col. 10:44-52, that the second incident location 232 is "spatially separated" from the first incident location 231, and that the incident locations are arranged in a row along the perimeter of the polygon. See also, Flint col. 5:67 to col. 6:7, where the second incident location is described as "spaced apart" from the first incident location, and Flint col. 7:5-7, where it is taught that the first and second incident locations have a center-to-center distance of approximately one-half of the polygon facet length. Flint further discloses that, in the case where there are more than two light beams used, each incident location is separated by an approximately equal distance from the adjacent incident locations (col. 6:59-61).

Flint's apparatus requires the above-discussed linear arrangement of spaced-apart incident locations to function as a progressive scanner for displaying a two-dimensional image (i.e., a video image). As a result, it has a duty cycle of only about 50% (see Flint col. 5:13-22). In contrast, the scanner of the present invention has a duty cycle of close to 100 percent, and has a

high data rate. Thus, Flint's apparatus is fundamentally different in structure and technique from the claimed scanning system and method, because it is designed to do a very different job.

Flint does not anticipate amended independent claims 1, 15, 16 and 22, because it does not disclose each and every element of those claims. In particular, Flint does not disclose an apparatus for, or step of, impinging more than one light beam on a polygon facet at substantially the same incident location. Moreover, one skilled in the art would not have been motivated to modify the apparatus of Flint to yield the inventions of claims 1, 15, 16 or 22. Flint teaches away from the claimed apparatus for (and step of) impinging more than one light beam on a polygon facet at substantially the same incident location, explicitly disclosing spacing apart the incident locations of its light beams on its polygon facet.

Consequently, independent claims 1, 15, 16 and 22 are patentable, as are claims 2, 3, 6, 7, 10-14, 17, 19-21, 23-25, 27-29 and 31-33, which depend from claims 1, 15, 16 and 22, respectively.

Regarding the obviousness rejection of dependent claims 4, 5, 18, 26 and 30 based on Flint, these claims are patentable by virtue of their dependency from independent claims 1 and 16.

Regarding the obviousness rejection of dependent claims 8 and 9 based on Flint and Fantuzzo, the Fantuzzo reference does not disclose or suggest the feature of claim 1 (from which claims 8 and 9 depend) missing from Flint, of a second light source for directing a second light beam to impinge on the facet at substantially the incident location of the first light beam. Therefore, any combination of Flint and Fantuzzo, however made, would still be missing this important claimed feature, and it would not have been obvious to add this feature to any Flint/Fantuzzo combination.

Consequently, claims 8 and 9 are patentable.

Reconsideration and withdrawal of the rejections of the claims under 35 U.S.C. §§ 102 and 103 are respectfully requested.

Accordingly, it is believed that all pending claims are now in condition for allowance. Applicant therefore respectfully requests an early and favorable reconsideration and allowance of this application. If there are any outstanding issues which might be resolved by an interview or an Examiner's amendment, the Examiner is invited to call Applicant's representative at the telephone number shown below.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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A handwritten signature in black ink that reads "Michael A. Messina". The signature is written in a cursive, flowing style.

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